NOTE: In the following trial data "NP2" is the development name for MIDI-Zen®.

Trial Year 2006-07

Prior to starting the second year of field trials, laboratory studies were carried out on detached leaves which showed that NP2 was highly effective against botrytis (>90% reduction in infection) even when the dose was reduced to 1/3 of the original formulation. This reduced dose formulation was evaluated in field trials which were based solely in Hawke's Bay on Chardonnay and Sauvignon Blanc to avoid complications of regional variability. The spray schedules are given in Table 1.

The two biologically-based programmes, BZ/NP2/BCA-L1 (BCA-L1 is another biological controlling agent) and BZ/NP2/AZ, were comparable in disease control to a high intensity fungicide programme (ten applications over the season) in both Chardonnay and Sauvignon Blanc with no significant effects on fruit quality or yield (Table 2). Use of the lower dose NP2 product and target spraying overcame all phytotoxicity that was observed in the previous season. The BZ/NP2/BCA-L1 programme was the most effective in the trials, controlling botrytis by 92% in Chardonnay and 89% in Sauvignon Blanc. Importantly, additional observations noted that NP2 was as effective as Topas®200EW when applied at post-bloom for control of powdery mildew which opens up new possibilities for NP2 to be integrated with biologically-based products early-season for both botrytis and powdery mildew control and this requires further investigation.

Table 1. The full season spray schedules used in field trials on Hawke's Bay Chardonnay and Sauvignon Blanc in 2006-07.

Spray Programme	5% bloom	80% bloom	Berries pea size	Pre-bunch closure	Bunches closed	Post-bunch closure	Veraison	Veraison complete	4 weeks pre-vintage	2 weeks pre-vintage
Fungicide	E. Multi	Switch	Captan	Switch	Captan	Captan	Captan	Captan	Captan	Rovral
BZ/NP2/BCA-L1	BZ	BZ	BZ	NP2	NP2	NP2	BCA-L1	BCA-L1	BCA-L1	BCA-L1
BZ/NP2/AZ	BZ	BZ	BZ	NP2	NP2	NP2	AZ	AZ	AZ	AZ

Table 2. Harvest results in field trials on Hawke's Bay Chardonnay and Sauvignon Blanc in 2006-07.

	Chardonnay				Sauvignon Blanc			
Programme	**Botrytis crop loss (%)**	**Botrytis control (% efficacy)**	**Brix**	**Yield (t/ha)**	**Botrytis crop loss (%)**	**Botrytis control (% efficacy)**	**Brix**	**Yield (t/ha)**
Nil	7.4*	0	20.8	14.4	5.0*	0	19.2	14.2
Fungicide	0.4	95	20.4	14.6	0.8	84	19.8	13.6
BZ/NP2/BCA-L1	0.6	92	19.9	16.1	0.5	89	18.7	11.6
BZ/NP2/AZ	1.4*	81	20.5	15.0	1.2	76	19.1	12.7
*Significantly different from the fungicide programme (P<0.05)								

Trial Year 2007-08

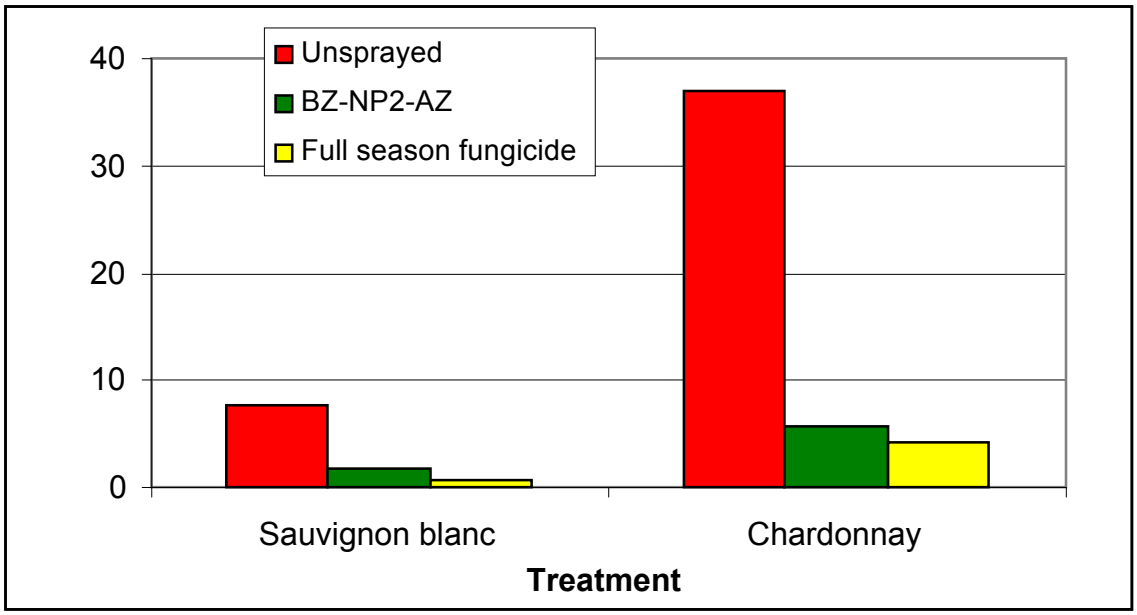
The main field trials were carried out in Hawke's Bay Chardonnay and Sauvignon blanc, Marlborough Sauvignon Blanc and Gisborne Chardonnay. In the Hawke's Bay, it was a typical botrytis risk year with 21 botrytis infection periods (IP's) during this season. In contrast, in Marlborough there were 11 IP's between the start of flowering and harvest compared to the 10 year average of only eight, which meant that there was a higher botrytis risk than normal.

Once again, the two NP2 developmental spray programmes in Hawke's Bay Chardonnay resulted in similar botrytis control to the full-season fungicide programme (Table 3). However for the first time, an unexpected delay in fruit maturity was observed in Hawke's Bay Chardonnay which we had not seen before. The programmes also performed as well for the Chardonnay trial in Gisborne, where high disease pressure resulted in 40% crop loss in the unsprayed vines.

Table 3. Botrytis bunch rot crop loss (%) at harvest in field trials on Hawke's Bay and Gisborne Chardonnay and Hawke's Bay and Marlborough Sauvignon blanc in 2007-08.

	Hawke's Bay Chardonnay	Gisborne Chardonnay	Hawke's Bay Sauvignon blanc	Marlborough Sauvignon blanc
Spray Programme				
Nil (unsprayed)	37*	39.9	7.73*	5.16*
Fungicide	4.1	34.9[1]	0.55	0.52
BZ/NP2/BCA-L1	5.3	13.2	0.86	6.71*
BZ/NP2/AZ	5.6	14.4*	1.64*	6.11*
*Significantly different from the fungicide programme (P<0.05)		[1] this fungicide programme had no late season sprays		

Botrytis Crop Loss (%)



Trial Year 2009-10

To address the spray coverage issues experienced in Marlborough in 2009, additional field trials were carried out on Sauvignon Blanc vines in Hawke's Bay and Marlborough that had been managed to produce either an open canopy (>70% bunch exposure) or a dense canopy (<30% bunch exposure, (Figure 3). Against these canopy management treatments, was an evaluation of the new and original NP2 formulations, applied in the mid-season, as part of programmes that used Captan early and late season, and these programmes were compared against unsprayed controls. (A change to the NP2 formulation was necessitated by withdrawal of one of the formulation components from the market place.)

In Hawke's Bay, there were several severe botrytis infection periods in the mid to late season which resulted in 8% crop loss in unsprayed vines. The NP2 programme significantly reduced botrytis crop loss in Hawke's Bay and had no significant effect on fruit yield. The new NP2 formulation performed as well as, or better than the original formulation – a great result (Table 4). The use of leaf plucking to achieve a more open canopy in Hawke's Bay greatly increased spray coverage, assessed with water sensitive spray papers (Figure 4), and significantly decreased botrytis crop loss. These results confirm that good bunch exposure is crucial for a natural product such as NP2.

In Marlborough, low rainfall meant we had to simulate conditions to induce botrytis development but crop losses in most treatments were still less than 0.5%.

Table 4. Botrytis bunch rot crop loss (%) at harvest in field trials on Hawke's Bay and Marlborough Sauvignon blanc in 2009-10.

	Botrytis crop loss (%)	
Programme	**Hawke's Bay**	**Marlborough**
Nil / plucked	6.12	0.12
Nil / unplucked	9.07	0.42*
New NP2 / plucked	0.53*	0.09
New NP2 / unplucked	2.66*	0.29
Old NP2 / plucked	1.35*	0.13
*Significantly different from the Nil / plucked programme (P<0.05)		